Approved for use through 7/31/06. OMB 0651-0031

Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

	(0.0)		eduction Act of 1995, no	o persons are requ	ired to respond to a collection of information u	inless it contains a valid OMB control number	
/	Substitute by	form 1449A/PTO			Complete if Known		
		2			Application Number	10/718,780	
	OCT 1 2 2004 1	NFORMATION	I DISCLOSUF	RE	Filing Date	November 20, 2003	
	נונו י ב	TATEMENT E	BY APPLICAN	IT	First Named Inventor	Mehrdad NIKOONAHAD	
B	, ,	7			Art Unit	Not Yet Assigned	
	RADEMAET	(use as many she	ets as necessary)		Examiner Name	Not Yet Assigned	
	Sheet	1	of	4	Attorney Docket Number	14434.4001	

	U.S. PATENT DOCUMENTS							
Examiner		U.S. Patent Document	Publication Date	Name of Patentee or				
Initials	Cite No.1	Number-Kind Code ^{2 (d known)}	MM-DD-YYYY	Applicant of Cited Document				
1.1	AA	US 2004/0070772 A1	04-15-2004	Shchegrov et al.				
25.	AB `	US 2004/0017574 A1	01-29-2004	Vuong et al.				
N.S.	AC	US 2003/0206298 A1	11-06-2003	Bischoff et al.				
N.R.	AD	US 2002/0101585 A1	08-01-2002	Benesch et al.				
N.R.	AE	US 2002/0051564 A1 .	05-02-2002	Benesch et al.				
N.L	AF	US 6,721,052 B2	04-13-2004	Zhao et al.				
NB	AG	US 6,704,661 B1	03-09-2004	Opsal et al.				
1.5	AH	US 6,694,284 B1	02-17-2004	Nikoonahad et al.				
N.B.	Al	US 6,694,275 B1	02-17-2004	Jakadar et al.				
N.1.	AJ	US 6,689,519 B2	02-10-2004	Brown et al.				

	FOREIGN PATENT DOCUMENTS							
Examiner Initials	Cite No.1	Foreign Patent Document Country ³ Number ⁴ Kind Code ^{5 (d known)}	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T ⁶			
·	BA							
	BB							

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS						
Examiner Initials'	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), little of the article (when appropriate), little of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²			
~, Ą	CA	LOGOFATU, PETRE C., "UV Scatterometry," Proceedings of SPIE: Metrology, Inspection, and Process Control for Microlithography XVII, May 2003, pp. 208-214, Vol. 5038, The International Society for Optical Engineering (SPIE), Bellingham, Washington, USA.				
NŅ	СВ	HETTWER, ANDREA et al., "Phi-Scatterometry for Integrated Linewidth and Process Control in DRAM Manufacturing," IEEE Transactions on Semiconductor Manufacturing, November 2002, pp. 470-477, Vol. 15, No. 4, Institute of Electrical and Electronics Engineers (IEEE), New York, New York, USA.				

Signature Considered Novo	٧4_
---------------------------	-----

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. *Applicants unique citation designation number (optional). *See Kinds of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. *Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). *For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. *Stind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. *Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is govern by 35 USC 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you are required to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS, SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Approved for use through 7/31/06. OMB 0651-0031
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Panerwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

Substitute for for	m 1449A/PTO			Complete if Known		
				Application Number	10/718,780	
INFORMATION DISCLOSURE				Filing Date	November 20, 2003	
ST	ATEMENT B	Y APPLICAN	IT	First Named Inventor	Mehrdad NIKOONAHAL Not Yet Assigned	
				Art Unit		
(use as many she	ets as necessary)		Examiner Name	Not Yet Assigned	
Sheet	2	of	4	Attorney Docket Number	14434.4001	

	U.S. PATENT DOCUMENTS								
Examiner		U.S. Patent Document	Publication Date	Name of Patentee or					
Initials	Cite No.1	Number-Kind Code ^{2 (if known)}	MM-DD-YYYY	Applicant of Cited Document					
N.A.	DA	US 6,665,071 B2	12-16-2003	Hovinen et al.					
√ -1	DB	US 6,645,824 B1	11-11-2003	Yang et al.					
Nos	DC	US 6,636,843 B2	10-21-2003	Doddi et al.					
N.O.	DD	US 6,633,831 B2	10-14-2003	Nikoonahad et al.					
N.A.	DE	US 6,608,690 B2	08-19-2003	Niu et al.					
N.13.	DF	US 6,608,686 B1	08-19-2003	Lane et al.					
NA	DG	US 6,583,731 B2	06-24-2003	Chan et al.					
J.B.	DH	US 6,483,580 B1	11-19-2002	Xu et al.					
1.1.	DI	US 6,451,621 B1	09-17-2002	Rangarajan et al.					
15,15	DJ	US 6,433,878 B1	08-13-2002	Niu et al.					

	•	FOREIGN PA	TENT DOCUMENTS	·	
Examiner Initials	Cite No.1	Foreign Patent Document Country ³ Number ⁴ Kind Code ^{5 (5 krown)}	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T°
-	EA				
	EB		,		

	,	OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Examiner Initials'	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
به بر	FA	NIU, XINHUI et al., "Specular Spectroscopic Scatterometry," IEEE Transactions on Semiconductor Manufacturing, May 2001, pp. 97-111, Vol. 14, No. 2, Institute of Electrical and Electronics Engineers (IEEE), New York, New York, USA.	
N.B.	FB	SCHNEIDER, CLAUS et al., "Integrated metrology: An enabler for advanced process control (APC)," Proceedings of SPIE: In-Line Characterization, Yield, Reliability, and Failure Analysis in Microelectronic Manufacturing II, April 2001, pp. 118-130, Vol. 4406, The International Society for Optical Engineering (SPIE), Bellingham, Washington, USA.	

Examiner		Date	
Signature	N. J. S.	Considered	/NOV 2004

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹Applicants unique citation designation number (optional). ²See Kinds of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁸Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is govern by 35 USC 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you are required to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS, SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for fo	orm 1449A/PTO	•		Complete if Known		
	•	,		Application Number	10/718,780	
. 11	NFORMATION	N DISCLOSUR	E	Filing Date	November 20, 2003	
S	TATEMENT I	BY APPLICAN	T	First Named Inventor	Mehrdad NIKOONAHAD	
				Art Unit .	Not Yet Assigned	
	(use as many she	eets as necessary)		Examiner Name	Not Yet Assigned	
Sheet	3	of	4	Attorney Docket Number	14434.4001	

	U.S. PATENT DOCUMENTS								
Examiner		· U.S. Patent Document	Publication Date	Name of Patentee or					
Initials	Cite No.1	Number-Kind Code ^{2 (f known)}	MM-DD-YYYY	Applicant of Cited Document					
IN-R	GA	US 6,429,943 B1	08-06-2002	Opsal et al.					
N-R-	GB	US 6,323,946 B1	11-27-2002	Norton					
NA	GC	6,124,924	09-26-2000	Feldman et al.					
NB.	GD	5,771,094	06-23-1998	Carter et al.					
J. B.	GE	5,747,813	05-05-1998	Norton et al.					
NS	GF	5,608,526	03-04-1997	Piwonka-Corle et al.					
~ · S ·	GG	5,604,344	02-18-1997	Finarov et al.					
NA.	GH	5,596,411	01-21-1997	Fanton et al.					
NB.	GI	5,412,473	05-02-1995	Rosencwaig et al.					
v1	GJ	5,329,357	07-12-1994	Bernoux et al.					

		FOREIGN PA	TENT DOCUMENTS		
Examiner Initials	.Cite No.1	Foreign Patent Document Country ³ Number ⁴ Kind Code ⁵ (d known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	
	НА				
	НВ	·			

		OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Examiner Initials'	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
NA.	IA	BENESCH, NORBERT et al., "Phi-Scatterometry for Integrated Linewidth Control in DRAM Manufacturing," 2001 IEEE International Symposium on Semiconductor Manufacturing, October 8-10, 2001, pp. 129-132, IEEE Catalog No. 01CH37203, San Jose, California, USA.	
NB.	IB	COULOMBE, STEPHEN A. et al., "Scatterometry measurement of sub-0.1 μ m linewidth gratings," Journal of Vacuum Science & Technology B: Microelectronics and Nanometer Structures, January, 1998, pp. 80-87, Vol. 16, Issue 1, American Vacuum Society, Research Triangle Park, North Carolina, USA.	

Examiner Signature	~ P.M	Date Considered	1 NOV 2004	
			1 1 1 0 0 1	_

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹Applicants unique citation designation number (optional). ²See Kinds of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁸Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is govern by 35 USC 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you are required to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS, SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Approved for use through 7/31/06. OMB 0651-0031 Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO				Complete if Known		
				Application Number 10/718,780		
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Filing Date	November 20, 2003	
				First Named Inventor	Mehrdad NIKOONAHAD	
•				Art Unit	Not Yet Assigned	
(use as many sheets as necessary)				Examiner Name	Not Yet Assigned	
Sheet	4	of	4	Attorney Docket Number	14434.4001	

		U.S. PA	TENT DOCUMENTS	
Examiner		U.S. Patent Document	Publication Date	Name of Patentee or
Initials	Cite No.1	Number-Kind Code ^{2 (if known)}	MM-DD-YYYY	Applicant of Cited Document
n.	JA	5,181,080	01-19-1993	Fanton et al.
NB.	JB	5,042,951	08-27-1991	Gold et al.
NR.	JC	4,999,014	03-12-1991	Gold et al.
			•	
		·		
		,		
	-			

FOREIGN PATENT DOCUMENTS					
Examiner Initials	Cite No.1	Foreign Patent Document Country ³ Number ⁴ Kind Code ^{5 (I known)}	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Citéd Document	T ⁶
	КА				
	КВ				

		OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Examiner Initials'	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
N.B.	LĄ	RAYMOND, CHRISTOPHER J. et al., "Multiparameter grating metrology using optical scatterometry," Journal of Vacuum Science & Technology B: Microelectronics and Nanometer Structures, March, 1997, pp. 361-368, Vol. 15, Issue 2, American Vacuum Society, Research Triangle Park, North Carolina, USA.	
N.J.	LB	GIOVANNINI, H. et al., "Angle-resolved polarimetric phase measurement for the characterization of gratings," Optics Letters, October 15, 1996, pp. 1619-1621, Vol. 21, No. 20, Optical Society of America, Washington, DC, USA.	

		<u></u>	,		
Examiner	. 1	01	Date	, .	
Signature		15	Considered	10002004	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹Applicants unique citation designation number (optional). ²See Kinds of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is govern by 35 USC 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you are required to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS, SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. 22313-1450